REMARKS/ARGUMENTS:

Claims 1-17 are pending in this Application. In the Office Action dated November 17th, 2004, the Examiner has allowed claims 2-9 and 11-17, and has rejected claims 1 and 10 under 35 USC 103(a) over US Pat. No. 6,347,234 (Scherzer) in view of US Pat. No. 6,260,968 (Gardner).

Claim 1 recites in relevant part (and claim 10 recites in near identical language):

> where said M elements are spaced apart by more than one-half wavelength from one another, and where the spacing is a function of a size of an aperture of said antenna array which is a function of a signal bandwidth to carrier frequency ratio.

The Examiner recites at page 3 of the Office Action that Scherzer teaches (at col. 14, line 64 to col. 15, line 4) that antenna elements are sufficiently spaced in a wide aperture. The Examiner further asserts that Gardner teaches (at col. 6, lines 4-8) that the antenna elements are separated by approximately one-half the wavelength corresponding to the highest frequency in the reception band. The Applicant agrees that the above statements accurately represent the cited teachings, but contend that even their combination fails to render obvious the above-cited element of claims 1 and 10.

Specifically, claims 1 and 10 stipulate two criteria for antenna spacing:

- more than one half wavelength; and
- a function of a size of an aperture of the array which is a function of a bandwidth to carrier frequency ratio (B/f_c or f_c/B).

Assuming arguendo that "approximately one half wavelength" renders obvious the first criteria "more than one-half wavelength", the references alone or combined fail to teach or suggest the second criteria: that the spacing is a function aperture size which is a function of the claimed *ratio*. Rather, they disclose only that the antenna spacing is approximately one half of wavelength, which cannot render obvious the claimed ratio. The combination is silent concerning the second criteria.

The Applicant provides an example to show the distinction, using the values for frequency and bandwidth provided in the written description at page 25, lines 4-10: carrier frequency

f_c=2.0 GHz and bandwidth B=3.5 MHz. Employing the well-known frequency-wavelength equation $\lambda=f_c/c$, where $c=3*10^8$ m/s is the radio-wave propagation speed (speed of light), the operative wavelength is then λ=14.99 cm, rounded to 15 cm for this example. The asserted combination of Scherzer and Gardner then provide a separation distance between antenna elements of approximately ($\lambda/2$)=7.5 cm, which the asserted combination teaches is proper regardless of bandwidth.

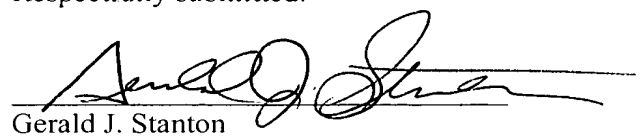
Conversely, the present claims 1 and 10 provide an aperture size that is a function of B/f_c = 0.00175 or f_c/B=571.4 (the second criteria above), and that the antennas must also be spaced apart by greater than 7.5 cm (the first criteria above). Changing the bandwidth changes the ratio on which the function of claims 1 and 10 operates, whereas changing the bandwidth effects no change to the spacing of the asserted combination of Scherzer and Gardner. Using the function $(p/360)*(f_c/B)$ where p=10 degrees (as in the written description at page 25), the aperture size is then 15.87 wavelengths or 2.38 m. If there were thirty antenna elements in the array, then the spacing between them would be (238cm/30)=7.93 cm. Because this is also greater than one half wavelength ($\lambda/2$)=7.5 cm, such an antenna arrangement would satisfy claims 1 and 10. Leaving all else constant and changing the bandwidth to B=3.0 MHz yields an antenna spacing 9.25 cm. This result is not an obvious variant of the asserted combination, because that combination provides spacing of 7.5 cm in both instances. This is because the cited prior art teaches that antenna element spacing derives only from wavelength, not from the ratio f_c/B or B/f_c.

Given the above-repeated teachings of the prior art that both the Examiner and the Applicant do not contest, it is asserted that the rejection fails to set forth a prima facie case for obviousness because no reference, alone or in combination, is seen to teach or suggest either antenna spacing or aperture size that is a function of the ratio of bandwidth to frequency. See MPEP 2142 and 2143.03.

For at least the above reasons, the Applicants believe that claims 1 and 10 are patentable over the cited art. The Examiner is respectfully requested to review claims 1 and 10 against the references in light of the above remarks. It is believed the distinctions will

then be apparent, and the Applicants request the Examiner withdraw all rejections and pass all of claims 1-17 to issue. The undersigned representative welcomes the opportunity to resolve any remaining matters via teleconference, as the Examiner sees fit.

Respectfully submitted:



Gerald J. Stanton
Reg. No.: 46,008

February 17, 2005
Date

Customer No. 29683
HARRINGTON & SMITH, LLP
4 Research Drive
Shelton, CT 06484-6212
Phone: (203) 925-9400
Facsimile: (203) 944-0245
Email: gstanton@hspatent.com

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

February 17, 2005
Date

Ann Okrentowich

AMENDMENTS TO THE DRAWINGS:

Attached are seven pages of formal drawings to replace those on file. The original application was filed with informal drawings numbered 1-5, 6A, 6B, 7-10, 11A, and 11B. The formal drawings filed on June 18, 2001 failed to include replacement sheets for informal drawing Figs. 11A-11B. That oversight is cured by the drawing submission herein, in which all seven drawing sheets are formal and annotated in the margin as replacement sheets. No new matter is added.